

WHAT IS CLAIMED IS:

1. An exposure apparatus capable of selectively switching between a plurality of exposure methods, comprising:

5 setting means for setting exposure conditions for an exposure target;

 a calculating means for calculating evaluation item values to determine the exposure method based on said set exposure conditions; and

10 determining means for selecting an exposure method that matches the exposure conditions for said exposure target based on the evaluation item values calculated by said calculating means.

15 2. The exposure apparatus according to claim 1, wherein said determining means selects from among said plurality of exposure methods taking into account at least two evaluation item values for every wafer, shot or lot.

20

3. The exposure apparatus according to claim 1, wherein said calculating means calculates said evaluation item values based on an evaluation item value calculation expression:

25
$$C(N) = F(SYL(N)) + G(SX(N), SY(N)) + H(\delta X(N), \delta Y(N)) + K(L) + P(M) + Q(S, SY(N))$$

where

SX: Position of the shot on the wafer in the non-scanning direction

SY: Position of the shot on the wafer in the scanning direction

5 δX : Image shift in the non-scanning direction in the shot

δY : Image shift in the scanning direction in the shot

L: Layout correlation coefficient

10 M: Lot printing method indication value

N: Shot number on one wafer

S: Synchronization accuracy target value
and the exposure conditions set by said setting means.

15 4. The exposure apparatus according to claim 1,
wherein said calculating means, in the calculation of
said evaluation item values, calculates evaluation item
values according to the location of a shot based on the
position of the shot in the non-scanning direction (SX)
20 on a substrate and/or the position of the shot in the
scanning direction (SY) on the substrate and data.

5. The exposure apparatus according to claim 1,
wherein said calculating means, in the calculation of
25 said evaluation item values, calculates evaluation item
values related to a shape shift of a shot base pattern
during multiple printing based on an image shift (δX)

in the non-scanning direction in the shot and/or image shift (δY) in the scanning direction in the shot.

6. The exposure apparatus according to claim 1,
5 wherein said calculating means, in the calculation of said evaluation item values, evaluates whether or not to use previously measured correction data based on a shot layout correlation coefficient (L).
- 10 7. The exposure apparatus according to claim 1, wherein said calculating means, in the calculation of said evaluation item values, calculates evaluation item values taking into account at least any one of the shot, substrate and lot printing method indication value (M).
- 15 8. The exposure apparatus according to claim 1, wherein said calculating means, in the calculation of said evaluation item values, calculates evaluation item values to synchronize the drive stages taking into
20 account a synchronization accuracy target value (S).
9. The exposure apparatus according to claim 1, wherein the plurality of exposure methods include three exposure methods of static exposure that performs
25 exposure with the stage standing still, constant speed scanning exposure with the stage running at a constant speed while carrying out scanning exposure and

accelerated/decelerated scanning exposure with the stage running at an inconstant speed while carrying out scanning exposure, and

said determining means selects an exposure method
5 that matches the exposure conditions from among the three exposure methods based on said evaluation item values.

10. An exposure apparatus capable of selectively
10 switching between a plurality of exposure methods, comprising:

setting means for setting exposure conditions for an exposure target;

a calculating means for calculating evaluation
15 item values to determine an exposure method based on the set exposure conditions; and

determining means for selecting an exposure method that matches the exposure conditions for said exposure target based on the evaluation item values calculated
20 by said calculating means,

wherein said calculating means, in the calculation of said evaluation item values, calculates evaluation item values according to the location of a shot based on the position of the shot in the non-scanning
25 direction on a substrate and/or the position of the shot in the scanning direction on the substrate and data, and

09064648-092804
T08260-84949660

09964648-092801

12. An exposure apparatus capable of selectively switching between a plurality of exposure methods, comprising:

5 setting means for setting exposure conditions for an exposure target;

 a calculating means for calculating evaluation item values to determine an exposure method based on said set exposure conditions; and

10 determining means for selecting an exposure method that matches the exposure conditions for said exposure target based on the evaluation item values calculated by said calculating means,

 wherein said calculating means, in the calculation of said evaluation item values, evaluates whether or not to use previously measured correction data based on a shot layout correlation coefficient, and

15 said determining means selects an exposure method according to the evaluation as to whether or not to use said evaluated previously measured correction data.

20

13. An exposure apparatus capable of selectively switching between a plurality of exposure methods, comprising:

25 setting means for setting exposure conditions for an exposure target;

09964648-092801

a calculating means for calculating evaluation item values to determine an exposure method based on said set exposure conditions; and

determining means for selecting an exposure method
5 that matches the exposure conditions for said exposure target based on the evaluation item values calculated by said calculating means,

wherein said calculating means, in the calculation of said evaluation item values, calculates evaluation
10 item values taking into account at least any one of the shot, substrate or lot printing method indication value, and

said determining means selects an exposure method that matches the specified printing method based on
15 said calculated evaluation item values.

14. An exposure apparatus capable of selectively switching between a plurality of exposure methods, comprising:

20 setting means for setting exposure conditions for an exposure target;

a calculating means for calculating evaluation item values to determine an exposure method based on said set exposure conditions; and

25 determining means for selecting an exposure method that matches the exposure conditions for said exposure

the stage running at a constant speed while carrying out scanning exposure and accelerated/decelerated scanning exposure with the stage running at an inconstant speed while carrying out scanning exposure.

5

16. The exposure apparatus according to claim 15, wherein said determining means selects from among at least two exposure methods of constant speed scanning exposure with the stage running at a constant speed while carrying out scanning exposure and accelerated/decelerated scanning exposure with the stage running at an inconstant speed while carrying out scanning exposure.

15 17. The exposure apparatus according to claim 15, wherein said determining means selects static exposure that performs exposure with the stage standing still.

18. The exposure apparatus according to claim 15, wherein said calculating means calculates the evaluation item values based on the exposure conditions for every lot, substrate and shot and said determining means switches between exposure methods according to said evaluation item values.

25

19. A semiconductor device manufacturing method, comprising the steps of:

installing a plurality of semiconductor
manufacturing apparatuses for a plurality of processes
including an exposure apparatus in factory; and

manufacturing semiconductor devices through a
5 plurality of processes using said plurality of
semiconductor manufacturing apparatuses,

wherein the exposure apparatus (claim 1)
comprises:

setting means for setting exposure conditions for
10 an exposure target;

a calculating means for calculating evaluation
item values to determine an exposure method based on
said set exposure conditions; and

determining means for selecting an exposure method
15 that matches the exposure conditions for said exposure
target based on the evaluation item values calculated
by said calculating means.

20. The semiconductor device manufacturing method
20 according to claim 19, further comprising the steps of:

connecting said plurality of semiconductor
manufacturing apparatuses via a local area network;

connecting said local area network and an external
network outside said factory;

25 acquiring information on said exposure apparatus
from a database on said external network using said
local area network and said external network; and

external network outside a factory in which the exposure apparatus is installed;

connecting said exposure apparatus to a local area network in said factory; and

5 performing maintenance of said exposure apparatus based on information stored in said database using said external network and said local area network,

wherein said exposure apparatus (claim 1) comprises:

10 setting means for setting exposure conditions for an exposure target;

a calculating means for calculating evaluation item values to determine an exposure method based on said set exposure conditions; and

15 determining means for selecting an exposure method that matches the exposure conditions for said exposure target based on the evaluation item values calculated by said calculating means.

20 23. The maintenance method for an exposure apparatus according to claim 22, comprising the steps of:

a vendor or user of said exposure apparatus providing a maintenance database connected to the external network outside the factory;

25 allowing access to said maintenance database from said semiconductor manufacturing factory via said external network; and

5 sending the maintenance information stored in said
maintenance database to the semiconductor manufacturing
factory via said external network.

- 5 24. The exposure apparatus according to claim 1,
comprising:

an interface for connecting a network;

- 10 a computer for executing network software that
performs data communication of the maintenance
information of said exposure apparatus via said
network; and

- 15 a display for displaying the maintenance
information of said exposure apparatus communicated by
the network software executed by said computer.

- 20 25. The exposure apparatus according to claim 24,
wherein said network software provides on said
display a user interface for accessing the maintenance
database provided by the vendor or user of said
exposure apparatus connected to the external network of
the factory in which said exposure apparatus is
installed and allows information to be acquired from
said database via said external network.

- 25 26. The exposure apparatus according to claim 1,
wherein when a manual mode exposure method is
specified as said exposure conditions, said determining

